Joint Live Fire Program Tests Full-Up Stinger Missile Against F-14 Tomcat

by Mr. Thomas Julian

The Director, Operational Test and Evaluation (DOT&E)-sponsored Joint Live Fire (JLF) Program performed a live fire test shot of a Stinger missile against a recently retired F-14 Tomcat on Wednesday, July 14, 1999. The test was the first in a series of tests with complete aircraft to assess the vulnerability of our aircraft to shoul-

INCOMING! Stinger missile fired by US Marines of the Third Low Altitude Air Defense Battalion (Camp Pendleton, CA) homes in an F-14 Tomcat in a Joint Live Fire test at the Naval Air Warfare Center Weapons Division, China Lake, CA.

der-fired, man-portable missiles. The test was conducted by the Navy's Weapons Survivability Laboratory, at the Naval Air Warfare Center, China Lake. The missile was shoulder-launched by Marine Corps personnel, flew free flight, guided itself to the target, and detonated on impact with the aft portion of a static F-14 aircraft. Analysts, who are developing modeling and simulation capabilities for prediction and assessment of aircraft vulnerabilities to Man-Portable Air Defense Systems (MANPADS), are evaluating the damage to the test article. Representatives from DOT&E, the services, and industry witnessed the test first-hand.

This test demonstrated that, by working as a team, we have the ability to accomplish several different objectives with one test. The U.S. Marine Corps' Third Low Altitude Air Defense Battalion, from Camp Pendleton, provided the fire team and basic Stinger missile. For them, this test was a realistic training exercise—an example of one of the SECDEF themes, namely combining testing and training opportunities. It also served to develop test techniques for JLF, provided realistic lethality data for the Stinger Program Office, and realistic data for aircraft vulnerability assessment and future vulnerability reduction efforts.

The China Lake MANPADS program is just one of several closely coordinated activities currently underway in DoD to examine the MANPADS issue. The JTCG/AS, JLF, and the Services are sponsoring efforts in the area, and working as a team to quantify the threat, and develop susceptibility and vulnerability reduction approaches. Examples of this work include a JTCG/AS MANPADS study (see Editor's Notes on page 3 and "Aircraft Vulnerability to MANPADS Weapons" on page 4), an Air Force Research Laboratory (AFRL) evaluation of the lethality of several threat weapons against US systems (with testing at the Army's Aberdeen Proving Ground), and JLF's evaluation of the F-16 vulnerabilities, which is managed at AFRL with testing at Eglin AFB's Chicken Little Joint Program Office. By working as a team, the data, resources, and lessons learned are shared by all the services.

In addition to evaluations of aircraft and threat interactions, work is underway to assess the best way to assure realism in an investigation, yet retain the ability to collect pertinent threat and damage data. China Lake's Weapons Survivability Laboratory (WSL) has been conducting free-flight autonomous guidance and detonation of actual weapons against complete aircraft. The WSL also developed and operates, as part of the DOT&E/LFT funded JLF Program, the MIKES gun—the Missile Intercept Kinetic Energy Simulator. MIKES is a gas gun, capable of launching an entire missile, or just the warhead, at realistic velocities and close ranges. This test technique is being developed to obtain impacts under controlled conditions described in terms of impact location, angle, and velocity. It also allows a stationary target aircraft to be operating at combat power, while positioned in an airflow envi-

ronment from China Lake's High-Velocity Airflow System (HIVAS).

An Air Force MANPADS investigation, also sponsored by JLF, involves launching a MANPADS missile down a sled track to evaluate (and develop the potential to reduce) threat effects on single engine aircraft. The F-16 is being used for this evaluation, with targets salvaged from crashed systems or retired aircraft from Davis Monthan AFB. AFRL's Survivability and Safety Branch at Wright Patterson is managing the program, with testing performed at a track facility operated by the 46th Test Wing's Chicken Little Program Office at Eglin AFB. Several shots have been successfully launched against F-16 wings. This MANPADS rail launch method has, however, highlighted a fuzing problem that must be solved prior to rail launches against complete F-16's. In free flight testing, the Chicken Little Office recently launched a Stinger missile at an F-16 wing (another effort combining Stinger Program Office objectives with those of the aircraft survivability enhancement community).

The Aberdeen Test Center (ATC), located at Aberdeen Proving Ground, also has a capability for conducting sled track tests. The ATC recently adapted its track to launch MANPADS against aircraft. As part of AFRL's Air Defense Lethality Program, ATC is currently perfecting its methodology for conducting launches of MANPADS missiles against transport and other large aircraft.

The Institute for Defense Analyses (IDA) recently completed a study, sponsored by DOT&E/LFT, to assess the best way to conduct MANPADS testing. It addressed the question: "What is the best launch method to use in order to collect realistic MANPADS vulnerability data." The study takes into account cost, realism, target fidelity, attack angles, payload weight, etc. Early indications are that the "best" way may well be a combination of different approaches, depending on the program's objectives, budget, and required realism.

A number of DoD elements are working together to assure our ongoing programs are complementary, sharing resources and data, to assess this threat to our aircraft, and come up with ways to counter it. ■

About the Author

Mr. Julian is a staff action officer in the Live Fire Testing office of the Office of the Secretary of Defense, working for the Deputy Director, Operational Test and Evaluation, Live Fire Testing, Mr. Jim O'Bryon. Most his 20 year career has been spent working on Live Fire Programs. The last 7 years he has worked in the OSD Live Fire office at the Pentagon. He was previously with Chicken Little Project Office at Eglin AFB and also Aberdeen Proving Ground working on vulnerability programs for the Army. He is primarily a Land Combat Systems expert, but has expanded his area of knowledge into both fixed and rotary wing aircraft. He may be reached at TJulian@dote.osd.mil.

DIRECT HIT! Stinger missile warhead detonates after striking the F-14. The smoke ring came from the warhead detonation. Photographs by Danny Zurn.